

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.-14. (canceled).

15. (currently amended): A method of producing a reflection mask blank by forming, on a substrate, at least a multilayer reflection film for reflecting exposure light and an absorber layer formed on said multilayer reflection film for absorbing the exposure light, said method comprising:

a first measuring step of measuring a peak reflectance of the multilayer reflection film and a peak wavelength of the reflectance of the multilayer reflection film after the multilayer reflection film is formed on the substrate;

a step of carrying out a heat treatment for said substrate with the multilayer reflection film at a substrate heating temperature of said substrate with the multilayer reflection film which temperature is not lower than 50°C and not higher than a baking temperature of a resist film;

a second measuring step of measuring a peak reflectance of the multilayer reflection film and a peak wavelength of the reflectance of the multilayer reflection film after the heat treatment is carried out for said ~~sub-rate~~ substrate with the multilayer reflection film; and

a step of checking whether change in peak wavelength and decrease in peak reflectance due to differences between the peak wavelengths and between the peak reflectances measured in the first and the second measuring steps do not cause mismatching with reflection mirrors of a pattern transfer apparatus using a reflection mask produced from the reflection mask blank and do not thereby cause variation in size of a pattern formed on a semiconductor substrate by the use of the reflection mask.

16. (previously presented): A method of producing a reflection mask blank as claimed in claim 15, wherein the heat treatment is carried out by keeping said multilayer reflection film formed on said substrate in contact with a liquid held in a heated state.

17. (previously presented): A method of producing a reflection mask blank as claimed in claim 16, wherein the liquid is a cleaning liquid, the heat treatment being carried out simultaneously with cleaning using the cleaning liquid.

18. (previously presented): A method of producing a reflection mask blank as claimed in claim 15, wherein said resist film is a chemically amplified resist formed on the multilayer reflection film.

19. (previously presented): A method of producing a reflection mask blank as claimed in claim 15, wherein a substrate heating temperature of said substrate with the multilayer reflection film in the heat treatment is not lower than 50°C and not higher than 135°C, the heat treatment being carried out for a time period equal to 3 minutes or more.

20. (previously presented): A method of producing a reflection mask, comprising a step of forming a pattern in said absorber layer of the reflection mask blank produced by the method of producing a reflection mask blank claimed in claim 16.

21. (previously presented): A method of producing a semiconductor device, comprising a step of forming a fine pattern on a semiconductor substrate by lithography using said reflection mask produced by the method of producing a reflection mask claimed in claim 20.